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ABSTRACT

Although the internationalization of business makes cross-cultural research on workers' attitudes toward computer-based technology valuable to management, cross-cultural studies are rare. A study was conducted to determine whether employees in the United States differ from Canadian employees in their evaluation of computer-based technology due to the type of equipment used, hierarchical level in the organization, and the employee's sex. Twenty-eight Canadian and 15 United States employers from large firms, medium-sized firms, educational institutions, and government agencies selected equal numbers (3-6) of successful managers and support personnel from various departments. A total of 196 Canadian computer users and 95 U.S. computer users selected in this manner completed an anonymous questionnaire assessing their attitudes toward computer-based technology, how it supports individuals at work, whether they liked using their computers, and if such use made them more effective. Preliminary analyses provide some support for the hypothesis that employees working with intelligent workstations may perceive their computers differenly from peers working with main-frame terminals. In addition, the study investigated if men and women would differ in how they perceived computers at their workplace. Women in both countries differed from men in their attitudes toward computers. Moreover, the results obtained showed that women in the United States had different concerns relating to computer-mediated work than did their Canadian peers. A five-page list of references concludes the document. (NB)

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CROSS-CULTURAL ISSUES OF OFFICE TECHNOLOGY MANAGEMENT: COMPARING CANADA AND THE UNITED STATES

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CROSS-CULTURAL ISSUES OF OFFICE TECHNOLOGY MANAGEMENT: COMPARING CANADA AND THE UNITED STATES

Abstract

This study presents cross-cultural data from the U.S. and Canada. A scale measuring computer attitudes is used in order to examine whether computerization of work differentially affects employees in the two countries. The study explores the possibility that employees working with intelligent workstations may perceive their computers differently than peers working with main-frame terminals. Preliminary analyses provide some support for the hypothesis. Additionally, the study investigated if men and women would differ in how they perceive computers at their workplace. Women in both countries differed from men in their attitudes toward computers. However, the results obtained show that women in the U.S. have different concerns relating to computer-mediated work than their Canadian peers.

CROSS-CULTURAL ISSUES OF OFFICE TECHNOLOGY MANAGEMENT: COMPARING CANADA AND THE UNITED STATES

It is expected that by the end of this decade, the majority of clerical as well as managerial workers will use computers in their daily work (Giuliano, 1982; Gutek, 1983). The impact of computerization upon job design and work structure has already been substantial, and it has become an area of considerable interest for human resource management. However, most of the relevant research has dealt with areas such as human factors engineering, financing and organizational designing (e.g., Lieberman, Selig & Walsh, 1982, chap. 1 & 2). Policy and strategy issues, as related to computer technology, have taken most of the limelight in organizational literature (Megaw & Lloyd, 1984), while human resource aspects have largely been ignored by organizational researchers, even though additional work in this area is deemed necessary (Kahn, 1981).

This paper investigates how individual's attitudes toward a computer-based technology may differ across two countries. Specifically, this study looks at a construct of computer attitudes assessing worker's views about quality of job life, work effectiveness, control and communication. We intend to find out if employees in the U.S. differ from their Canadian peers in their evaluation of computerbased technology due to the type of equipment used, hierarchical level in the organization and the individual's sex. Cross-cultural research is rare. This is the case even though internationalization of business makes such research ever more valuable to management (Adler, 1983). Consequently, this study will also examine if two expanded scales, originally developed in the U.S., can be used success-

fully in both countries to explain differences related to computer attitudes. From a practical standpoint, this study gives a perspective on international differences which might help managers of multinational corporations to form reasonable expectations about organizational change and computerization of work. Ultimately, this would help attain the desired organizational goals.

The introduction of computer-based office information-technology into an existing office environment has usually been technology-led, without consideration of potentially negative effects upon the workforce and the quality of job life (Gattiker, 1984). The following literature review points out the human resource aspects of prior research in this area. Conceptual papers appear to outnumber applied studies, and most applied research to date has concentrated on computer technology from the organizational perspective (Megaw & Lloyd, 1984). Studies investigating the effects of gender, hierarchical level and type of technology on an individual's evaluation of the computer are lacking but needed (e.g., Kling, 1978; Panko, 1984).

Literature Review

Computerization and the Transformation of the Workplace

Apart from its impact upon the skill base of a company's workers, computer technology is expected to alter fundamentally the conditions of employment in organizations. Potential problems with computerization have already been noted in field studies and specified in the literature (e.g., Kling, 1978). As a consequence of such automation, many tasks could become more routine and repetitive and less challenging (Shepard, 1971, chap. 4). It is in the interest of both the organization and its

employees to interpret the ever increasing use of office technology as improving the quality of work life (Kahn, 1981). In a recent study, Gattiker, Gutek and Berger (1985) concluded that personal computers were indeed perceived as being most helpful in improving work effectiveness and the quality of job life.

Other relevant concerns are performance and control as perceived by employees (Salzman & Mirvis, 1985). Although computers may take credit for improving efficiency and effectiveness on the job, they can also facilitate new avenues of control for management, which could lead to worker hostility and unrest (Mankin, Bikson & Gutek, 1982). However, very little empirical research has been done in this area (e.g., Kling & Iacono, 1984).

Still another related factor is communication. Some technologies are more useful for this purpose than others, but the computer appears to have become an important new tool capable of improving communications. Yet research has shown that people communicating via computers evaluated each other less favorably than did people dealing face-to-face (Kiesler, Zubrow, Moses & Geller, 1985). This result is of crucial significance since a major part of office work involves the exchange of large amounts of data and information (Doswell, 1983; Panko, 1984).

Attitudes toward computer-based technology. Most new technologies are adapted in hopes of facilitating higher productivity and job satisfaction (Bodmer, 1982; Gutek, 1983). However, the relative neglect of user attitudes in the study of office information technology could be detrimental to these goals. Objective factors (the technology in a person's work

environment) affect subjective factors (perception of work), which, in turn, influence individual responses (productivity and absenteeism) (see Kahn, 1981; Katz & Kahn, 1978, pp. 577-609).

Organizations need to stay on top of the latest technological developments to remain competitive. At the same time, however, they ought to make sure that employees adapt to the altered working conditions created by the introduction of new technology. Employees should feel comfortable with the technology and perceive it as being helpful in their work (Gutek, 1983). It appears sensible, therefore, to expand the concept of organizational and individual fit by considering technological constraints as well. So too, human resource specialists and organizational researchers should consider individual, organizational and technological needs when trying to obtain a good match between a position and a potential employee (Gattiker, 1984).

Responses According to Computer Technology and Demographics

Computer technology. Some researchers have argued that different types of computer-based technology affect people's work differently (e.g., Salzman & Mirvis, 1985). For instance, employees working with a main-frame computer may perceive greater control when compared to users of personal computers or word processors (cf. Kling & Iacono, 1984). In contrast, some employees may feel computers are deskilling their work and may fear losing their job within the organization.

Much attention has been focused on intelligent workstations and their effectiveness in facilitating communication both within and without the organization (Demby, 1985). Spreadsheet and word-processing programs allow preparation of highly presentable

reports, often including graphics and figures. These and other new capabilities can improve communication through more effective use of the medium at either end (Pava, 1983). Yet, applied organizational research studying computers and communication is limited, and most existing research has not compared responses from individuals working with main-frame terminals as opposed to intelligent workstations (Kiesler, Zubrow, Moses & Geller, 1985). In a study using U.S. respondents from Fortune 500 companies, researchers found that participants who worked with intelligent workstations felt control was lower than their colleagues working with mainframe terminals. Additionally, quality of job life was perceived to be higher (Gattiker, Gutek & Berger, 1985). However, it would be interesting to test if these results could be repeated when including organizations of different types and sizes.

Demographics. Various research data showed that women are affected more often by computerization than men due to their occupations and positions, but these studies have not examined specifically if women evaluate the technology itself differently from their male peers (Form & McMillen, 1983; Gutek, 1983). One recent study, however, found that except for quality of job life and personal computers, women did not differ from men in how they perceived computers (Gattiker, Gutek & Berger, 1985). Work investigating these issues seems necessary.

Hierarchical level. While technologies may, in fact, change work content at various levels, attitudes would not necessarily reflect such objective developments (Gattiker, 1984). One explanation for the lack of differences in organizational levels could be the self-selection process. People tend to choose

positions which meet their needs and allow them to utilize their skills (e.g., Brousseau, 1983).

Empirical results have been mixed. For instance, Gattiker, Gutek and Berger (1985) found that managers did not differ from support-personnel in how they perceived their computers. Similar results were reported by Gattiker and Coe (1986) with Canadian respondents. But, the two studies mentioned used different types of organizations: whereas the former paper dealt with Fortune 500 companies all across the U.S., the latter research dealt with companies of different size and industry across Western Canada. It would be interesting to see if a cross-cultural study, using similar organizations, would show differences between these groups of employees (Gattiker & Coe, 1986).

Cross-cultural aspects. Hofstede (1984, p. 21) defines culture as: "the collective programming of the mind which distinguishes the members of one human group from another." Culture, in this sense, includes systems of attitudes and computer attitudes are now becoming a part of the building blocks of culture. Computerization is an international phenomena which affects management across countries. If management research is to remain relevant to executives, a substantially greater proportion of studies need to go beyond the purely domestic perspective (Adler, 1983).

Even though some researchers have stated attitudes may be the crucial link to the effective use of computers in organizations, cross-cultural research in this area is lacking (Gattiker, 1984). According to Adler (1983), cross-cultural management focuses on the description and comparison of

behaviours and attitudes across countries. Companies are not offered many studies which focus on a comparison between organizations in two or more countries. It would be of interest to see if a scale, measuring computer attitudes of office workers, could be used in more than one country. Internationalism demands that a narrow domestic paradigm be replaced with one that can encompass the diversity of a global perspective. So too, competitive advantage by an organization can only be achieved if the local culture is simultaneously taken into careful consideration when computerizing work places (cf. Gold, 1983).

Selection of Countries for Study

The countries chosen for the study were the United States and Canada. Canada was chosen for several reasons. First, many multinational corporations operate in Canada. Canada does about 75% of its foreign trade with the U.S. making it one of Canada's largest trading partners. Understanding the computer attitudes of employees in Canadian organizations and comparing them to those of employees in similar American organizations would be useful. Second, both countries have English as an official language, so identical questionnaires could be administered in Canada and the U.S. Third, since both countries are generally assumed to be similar in their culture and value, it would be of considerable interest to see if this would also apply to attitudes toward work with computers (Griffeth, Hom, DeNisi & Kirchner, 1985). In other words, some researchers have suggested that to increase our knowledge about international differences in work-related values and attitudes, it would seem fruitful to first compare countries with some similarities, before studying

countries with major differences (e.g., Hofstede, 1984, chap. 1 & 9).

Summary

A multiplicity of factors influence an individual's perception of computer-based technology. Efforts to create work systems capable of sustaining good job-person matches must deal with developmental issues such as technological innovations (e.g., Brousseau, 1983). Several important aspects have been identified pertaining to quality of job life, including a person's computer attitudes as well as type of computer-based technology, hierarchical level and gender (Podgorecki, 1981). However, organizational researchers have not embraced computerization and quality of job life, nor have they made a significant attempt to study the relationships between technology and demographics (cf. Kahn, 1981; Podgorecki, 1981). In sum, this study tried to discover how employees in two different cultures perceived their computers in an organizational setting.

Research Issues

The present study examined if the type of computer used can result in varying employee attitudes towards the technology and how gender and hierarchical level in the organization could affect those attitudes. Various researchers have mentioned these factors as potentially important; therefore, several analyses will be conducted to investigate these issues (e.g., Form & McMillen, 1983; Salzman & Mirvis, 1985). Additionally, a measure to assess computer attitudes developed and tested by Gattiker, Gutek & Berger (1985), and expanded and used in Canada by Gattiker and Coe (1986), will be applied to evaluate responses from two cultures.

The following hypotheses were established:

Hypothesis 1. In agreement with the literature previously cited, the computer attitude scales, measuring quality of job life, communication and control, will differ for the two countries.

The scale means obtained for quality of job life, communication and control will also be analyzed comparing the results of both countries along gender, type of computer and hierarchical level. However, previous studies have reported mixed results (e.g., Gattiker & Coe, 1986; Gattiker, Gutek & Berger, 1985). It will be interesting to see if the two countries' respondents will differ in their assessment of computerization based on gender, type of computer and hierarchical level.

Hypothesis 2. In accordance with the literature cited earlier, communication, control and quality of job life effects will be perceived differently by users of non-intelligent versus intelligent workstations in both cultures. The groups might also differ according to gender. Specifically, the following two predictions were made:

H2a. A respondent's evaluation of computers will differ based on the type most used in his/her work.

H2b. Computer evaluations will differ according to the respondent's gender.

Differences along hierarchical levels were open to question since previous results have been mixed (Gattiker & Coe, 1986; Gattiker, Gutek and Berger, 1985).

Method

Design and Subjects

Canada. A stratified sample of twenty eight employers was asked to participate in a survey of personnel and their "computer attitudes." The employers represented these groups: 10 were firms selected at random from the Globe and Mail annual roster of Canada's largest organizations; 12 companies were medium-sized firms from Western Canada; the final six comprised three educational institutions and three government agencies. Except for the stipulation of their locale (Western Canada), organizations were recruited randomly within each classification.

Organizational type was not a variable of interest here. The educational and government institutions were included because they brought potentially different organizational cultures and constructs of effectiveness to the sample, thus allowing more reliable generalizations from the findings (cf. Blalock, 1984, chap. 4).

All employers were asked to select three to six successful managers (female and male) and an equal number of support personnel from a variety of departments, and to distribute a questionnaire to these individuals. In order to avoid influencing selection decisions, organizations themselves determined what they considered to be "successful." Surveys were returned directly to the researchers.

Of the 380 people asked to participate in the study, 340 agreed and 306 responses were ultimately received (90%). Respondents included both sexes (about 66% were female) and approximately 65% were married. 196 (64%) of 306 participants were computer users, while the remaining 110 indicated other

primary technologies, such as the telephone or typewriter. The analyses performed for this study were based on the sample of 196 computer users.

United States. Again, a stratified sample of fifteen employers was asked to participate. The employers represented these groups: five were firms selected at random from the Fortune 500; five were medium sized firms from the Western U.S.; the final five comprised three educational institutions and two government agencies. Except for the stipulation of their locale (Western United States), organizations were recruited randomly within each classification.

The same procedure for respondent selection was used as described earlier. Of the 200 people asked to participate in the study, 185 agreed and 157 responses were ultimately received. Respondents included both sexes (about 47% were female) and approximately 68% were married. 95 (61%) of 157 participants were computer users, while the remaining 62 indicated other primary technologies, such as the telephone or typewriter. The following analyses are based on the 95 computer users.

Instrument

Respondents completed an anonymous questionnaire to assess their attitudes toward computer-based technology, specifically, how it supports individuals at work, whether they like using their computers, and if such use makes them more effective. A five-point scale, ranging from (1) "agree completely" to (5) "disagree completely," was provided. The original scale with 18 items had been developed by Gattiker, Gutek, and Berger (1985) using a U.S. sample. An expanded version with 27 items was developed by Gattiker and Coe (1986) using a Canadian sample.

The latter's instrument was used in this study. Additional questions about one's type of technology and the percentage of time spent using it were also included. The final section of the questionnaire concerned demographics, asking about annual income, educational background, job title and the like.

Analyses

First, confirmatory factor analysis was done with the variables measuring computer attitudes for both cultures. To decide the number of factors for orthogonal varimax rotation and interpretation, eigenvalues (>1.0) were considered (Kaiser, 1974). Item scale loadings greater than .30 were statistically significant ($p<.001$), according to the Burt-Banks criterion (Child, 1970). This conservative approach was used to avoid reporting results based on sample characteristics which could not be replicated in the future (cf. Webb, Campbell, Schwartz, Sechrest & Grove, 1981, chap. 3). The statistically significant items were then checked for their item-item and item-total correlation within each factor. Only items which correlated positively with other items in the same factor were retained for the scales discussed below (Nunnally, 1978, chap. 3 & 6). Five scales were constructed by averaging scores from the items which qualified using the above rules.

Second, the scales were then used for t-tests comparing the scale means obtained in the two cultures. Additionally, t-tests of the scale means were performed according to sex, type of computer used and hierarchical level (manager vs support personnel). Additionally, to test if significance, as obtained with the t-test, would reflect a sizable association in the data, the strength of statistical association was estimated using ω^2

(Omega) (Hays, 1981, pp. 293-298).

Third, variables sex and hierarchical level in the organization (manager or support personnel) were used to determine if they would help to distinguish among respondents' computer attitudes. The type of computer used (intelligent workstation versus main-frame terminal) was also included in these analyses. Univariate and multivariate analyses of variance were done to test for possible differences.

Results

Factors in Computer Attitudes

To obtain the independent factors, orthogonal varimax rotations and reliability analyses were done with the 27 items measuring computer attitudes. Loadings greater than .30 were statistically significant ($p<.001$, according to the Burt-Banks criterion). All 27 items measuring computer attitudes loaded highly enough and were retained to define the following four factors: (1) quality of job life, (2) work effectiveness, (3) communication, and (4) control. Since the factor analyses done here are confirmatory in their character, only the variance accounted for is reported (see Table 1). Factor loadings can be obtained from either author.

Except for control in the Canadian sample, the reliability coefficients for computer attitudes are well above .70 which has been suggested as a desirable minimum for constructs in the early stages of formulation (Nunnally, 1978, p. 245) (cf. Tables 1 and 2). Therefore, the extended version of the computer attitude measures developed by Gattiker and Coe (1986) can be applied in both countries, achieving desirable levels of reliability.

---Insert Table 1 about here--

Cross-Cultural Differences in Attitudes toward Computer Technology

H1 stated that the computer attitude scales measuring quality of job life, communication and control will differ for the two countries. In order to test this hypothesis, the scales were used for t-tests comparing the scale means obtained in the two countries. All computer users were placed into two separate groups according to country. None of the test results were statistically significant. Based on these results, H1 was not confirmed.

Additionally, the scales work effectiveness and an overall scale which contained all attitude scales were also tested for differences between the means. Neither of them resulted in a significant difference between the means. Tests were also run between the two countries' female and male, intelligent and main-frame terminal users, managers and support personnel. Of the thirty tests, only one was significant, namely, the difference between female respondents of both countries and their scale means measuring work effectiveness. The female respondents from the U.S. felt that computers helped to improve their work effectiveness more than their Canadian peers. However, estimating the strength of statistical association as suggested by Hays (1981, pp. 293-296) using ^{2} revealed a result of .002. The association of the data due to the culture effect is, therefore, trivial.

Computer Technology in the Office

Two types of computer-based technology were examined in these analyses, main-frame terminals and intelligent workstations (personal computer and word processor). Survey respondents were

grouped according to the type of computer used most often. Individual evaluations of computer-based technology were also examined according to gender and hierarchical level (managers vs. support personnel). Multivariate analysis of variance and univariate analysis of variance were used to compare the scores of each of the groups on the four factors.

Hypothesis 2a. This hypothesis stated that respondents would differ in their evaluation of a technology depending upon their use of a main-frame terminal or an intelligent workstation. The results of these two analyses for each type of computer are shown in Table 2.

Insert Table 2 about here

The multivariate test (F tests of Pillai's V from SPSSX MANOVA) showed reliable (F=2.62, p<05) differences between the technology groups on the pattern of their scores on the four factors for the Canadian sample. The univariate analysis of results also reveals a different pattern of responses for how intelligent workstation vs main-frame terminal users evaluated communication. This could mean that the factor communication distinguishes among individuals as to the type of workstation used. The means derived from the scales indicate that individuals working with intelligent workstations feel communication improves significantly when compared to main-frame terminal users (p < .01, by a two-tail t-test between the scale means of the two groups).

However, the results obtained for the U.S. group of respondents were statistically insignificant for the multivariate as well as the univariate analysis of variance done. These results support Hypothesis 2a only for the Canadian culture; they do not hold true for the U.S. respondents in this study.

Gender of Respondent

Hypothesis 2b suggested that individual evaluations of computer-based technology would differ according to gender. As Table 4 demonstrates (cf. last row -- "S with effects of C & M removed"), the multivariate test result for Canada (F test of Pillai's V = 3.51) shows a highly reliable ($p<.01$) difference between the men and women in the pattern of their scores on the four factors. The univariate tests using scores on the individual factors revealed group differences in both analyses for communication and control (means will be reported in the next section below). However, there were no reliable differences between a person's gender and his/her perceived quality of job life and work effectiveness.

For the U.S. respondents, the multivariate test result shows a difference ($p<.06$) between the men and women as well. However, it is rather small, and, as the univariate analysis of variance results revealed, only group differences for quality of job life are recorded. These results confirm Hypothesis 2b.

Type of computer. Since others had reported differences between respondents' gender and type of computer used in their work, this study also performed some tests to reveal if such differences would exist in both countries. Again, as discussed above, no differences were found for U.S. respondents.

For Canadians, a person's sex and the type of computer he/she uses were analyzed simultaneously with a multivariate test of Pillai's V ($F = 2.51$), and showed that respondents differ reliably ($p<.05$) in how they evaluate their computers (cf. Table 4). The univariate tests show that the respondents differ in their evaluation of the factors communication and control.

The means derived from the scales indicate that women perceived increased control when working with a main-frame terminal ($p<.01$, by a two-tail t-test between the scale means of the two groups). Nevertheless, female respondents did not differ statistically significantly from male respondents in their perception of control when judging intelligent workstations.

These means also show that female respondents differ in their evaluation of computer-aided communication. Women perceived less improvement in communication possibilities from intelligent workstations than men did ($p<.01$, by a two-tail t-test of the two scale means). However, female respondents did not significantly differ from their male peers when assessing communication with main-frame terminals.

Looking at the U.S. respondents, the multivariate test showed no reliable differences between the gender groups on the pattern of their scores on the four factors, nor did the univariate F-tests in this study.

Type of Computer and Hierarchical Level

Table 4 illustrates that for Canadian survey participants, one's position in an organizational hierarchy does not really help to differentiate between respondents. In other words, Canadians participating in this survey did not differ along hierarchical lines (manager versus support-personnel) in their evaluation of computer-based technology.

Further, table 4 shows that for U.S. respondents, hierarchical differences were only apparent looking at Pillai's V when interactions were allowed for (3.90, $p<.01$). Looking at the univariate results and testing for hierarchical level only, U.S. respondents felt that control was higher for support-personnel

than for managers as exercised by the computer ($p<.01$, by a two-tail t-test between the scale means of the two groups).

Discussion

The primary purpose of this study was to examine computer attitudes in two different cultures. Such attitudes most likely affect the computer user's quality of work life including productivity and absenteeism (Kahn, 1981). Employee attitudes toward computers are crucial when determining the effective use of computer technology in organizations (e.g., Carter, 1984; Pava, 1983). Furthermore, internationalization of business requires organizational researchers to provide new insights into cross-cultural management and its implications for computer users (Adler, 1983).

Computer attitudes in two countries. The scales used across national boundaries in this study are justified because: as with earlier studies using a shortened or the same scale (Gattiker, Gutek & Berger, 1985), the factor analysis performed with both countries' current data sets reveal that the same factor structure was obtained with very similar reliability levels.

The data also showed, however, that the two countries' respondents did not differ in how they evaluated quality of job life, communication or control as influenced by computer-mediated work. Except for work effectiveness, where Canadian and U.S. females differed in their assessment of computer effects, none of the additional statistics revealed significant differences between the two countries. One explanation for this pattern could be that the two cultures surveyed are relatively similar, use the same language and have an adjoining land border facilitating extensive border traffic (cf. Sekaran, 1986).

Another explanation, as some research has indicated, is that work values and attitudes are similar; therefore, such results should be expected (Hofstede, 1984, chap. 9). Giving even stronger support to these results is that, at the time of the survey, more than 80% of the users in both samples had worked with the technology for more than 3.5 years; differences due to computer novelty were most likely eliminated.

Computer technology in the office and gender. The results reported in this study show that the respondents in the two countries both differed in how they assessed computer-based technology along gender. The Canadian respondents differed in how they assessed the effect of computer on communication and control. Women did not feel communication was improved by the computer, whereas their male counterparts did. Women also did not feel they had as much control over their work because of the computer, whereas men did. These results, then, confirm the ones obtained by Gattiker and Coe (1986).

Looking at the U.S. respondents, quality of job life was the most important factor to distinguish between female and male respondents. Again, females felt that quality of job life was less improved by working with a computer than their male counterparts. This result confirms an earlier study done by Gattiker, Gutek & Berger (1985).

Our data suggest that for men, computers seem to have a more positive effect than for women. Differences between the sexes are even more significant when considering the fact that respondents from both countries and sexes held similar jobs and worked in similar companies. Gutek and Bikson (1985) claim that opportunity structure and status differences in organization may

be more important in accounting for differential experiences than the technology itself. This claim, however, does not seem to be true when comparing women and men in similar positions across countries. Women's experiences are still different as this study indicates.

Even though the respondents did not differ across countries when comparing the scale means and doing t-tests on them (e.g., Canadian women's score on quality of work life against U.S. counterparts), differences were reported by the univariate tests. However, none of the differences in computer attitudes were on the same scale for both countries. This would seem to indicate that underlying differences in computer attitudes between the two cultures would have to exist. The study's data does not indicate what may account for such differences. One explanation for the U.S. result could be that the quality of job life issue and women and work has been more widely discussed since the sixties, whereas in Canada it is more recent (e.g., Gutek, Larwood & Stromberg, 1986). As a result, U.S. women may be better informed about the quality of job life issues, thereby leading them to more critical comparisons between their own situation and their male peers.

Looking at the type of computer used and the respondents' gender does not lead to significant differences in how U.S. respondents assess quality of job life. This finding does not support the work by Gattiker, Gutek and Berger (1985). One explanation could be that these authors used large organizations only, whereas this study used large and small, public and private firms. For Canadian respondents, however, once again control and communication computer attitudes differ, i.e. women feel less in

control than men while working with personal computers as well as main-frame terminals. One explanation could be that status differences and opportunity structure may still provide advantages for men as compared to women (cf. Gutek & Bikson, 1985). Even though the study tried to include respondents of both sexes and end-users doing similar work, there still may be differences underlying jobs between sexes, which this study could not account for.

Implications for Management and Future Research

This study provides strong evidence that research on computer-based office technology should be placed within a larger framework. Any understanding of the effective use of such technology is substantially undermined if employee perceptions are ignored. Future research should continue to explore this issue. In particular, the possible impact of non-work aspects and roles upon technology perception should be investigated.

To these authors best knowledge, this study is the first one to assess and compare computer attitudes of Canadian and U.S. office workers in similar organizational settings. A scale was used which had, in part, already been tested in both countries. The results established that the scales used were reliable. As well, their usefulness across the two cultures was established. Nevertheless, it would be interesting to assess the goodness-of-fit of the proposed factor structure obtained in this study by using a confirmatory factor analysis such as LISREL.

The results obtained showed that the two countries' office workers seem to have different computer attitudes. Although comparing the mean scores did not lead to statistically significant differences, looking at gender indicated that in

Canada and the U.S. females seem to perceive computers less positively than men. However, whereas the U.S. respondents differed in how they assessed quality of job life, Canadian females differed in how they assessed communication and control of computers. The results of earlier studies done in the same countries are confirmed by this study. As a result, there is strong support indicating that Canadian female office workers perceive computers differently than their colleagues in the U.S.

For managers, the results obtained present new confirmation that computerization of work does affect workers in two cultures differently. This, in itself, is a substantial contribution which should help managers to adapt their company's computerization of work to a given culture. The research also indicates that women's experiences are different from men's in two cultures. This is even more significant when considering that this study attempted to include respondents of both sexes with similar jobs and responsibilities. It also weakens Gutek and Bikson's (1985) claim that opportunity structure and status difference in firms may be more important. The results in this study indicate that the women's experiences need to be taken into careful consideration to avoid possible resistance (Gattiker & Larwood, 1986).

The implications of this study's results are highly complex. An attempt has been made in this research to follow the call that the narrow domestic paradigm be replaced with a more international paradigm by studying respondents from two cultures (Adler, 1983). The study indicated that hierarchical differences, even though they may be apparent to an objective outsider, are not perceived as such by the employees. This

result is confirmed by another study which found that job holders usually perceive their work characteristics differently than experts (Znanieck Lopata, Fordham Norr, Barnewolt & Miller, 1985). Even though information systems' literature indicates that expert systems and decision support systems need to be better integrated (Turban & Watkins, 1986), employees' computer attitudes indicate two concerns. First, the results indicate that at least Canadian users feel communication negatively affected by working with main-frame terminals. Second, lower level employees in the U.S. may perceive increased control exercised with such systems. If these two factors can be taken care of by the system's designers, the productivity increases intended may very well be achieved (Gattiker, 1984; Turban & Watkins, 1986). It is imperative to know individuals beliefs about computers to achieve effectiveness on using computer-based technology in offices. The findings of this research project should be of help to managers to achieve this goal across cultural settings.

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Table 1

Items Used to Define Four Factors: Computer Attitudes

Factor	Items	Item-Total Correlation USA	Item-Total Correlation CANADA	Cronbach's Alpha USA	Cronbach's Alpha CANADA	T-test Comparing Scale Means of the two Countries
1	This equipment is fun to use	.75	.71			
Quality of	Using this piece of equipment makes my work more interesting	.78	.76			
Job Life	I enjoy using this piece of equipment	.80	.81			
	This piece of equipment enables me to do interesting tasks at work	.75	.55			
	The use of this piece of equipment makes my work more enjoyable	.81	.82			
	I like doing my work with the help of this equipment	.78	.78			
	My work wouldn't be as much fun if I could not use the equipment	.62	.61	.92	.90	
	Variance explained per Factor	26.1	25.1			
	Scale means	1.78		1.80		n.s.
2	At my work, I depend a great deal on this equipment	.36	.38			
Work	This piece of equipment enables me to do my job more effectively	.55	.68			
Effectiveness	This piece of equipment makes my work easier	.58	.63			
	This piece of equipment supports me in my work	.49	.55			
	I am more effect. in work with this equip. than I would be with out it	.45	.65			
	Using this equipment make me more productive	.63	.72			
	This piece of equip. enables me to do my work faster	.52	.70			
	This piece of equip. enables me to do my job more thoroughly	.52	.70	.80	.87	
	Variance explained per factor	14.1	12.4			
	Scale means	1.48		1.58		n.s.
3	This piece of equip. facilitates communication among people in org.	.57	.56			
Communication	This piece of equip. facilitates communication with people out of org.	.61	.55			
	This piece of equip. allows me to transmit infor. to somebody else	.51	.52			
	I prefer a face-to-face meet. over using this equip. for important mat.	.29	.15			
	The use of this equip. has improved communication beyond the organization.(compared to previous methods)	.51	.56	.74	.71	
	Variance explained per factor	6.3	7.9			
	Scale means	2.47		2.26		n.s.
4	I feel this piece of equip. controls my behavior at work	.41	.40			
Control	This piece of equip. makes my work more demanding	.46	.29			
	My productivity is controlled by this equipment	.53	.41			
	Using this equip. limits my ability to move around	.35	.31			
	Generally, I prefer to communicate with equip. rather than face-to-face	.36	.31			
	If equip. is out of order, I cannot do my work	.44	.29			
	It is important to me that this equip. be in use throughout the day	.44	.30	.71	.61	
	Variance explained per factor	5.7	5.8			
	Scale means	2.33		2.37		n.s.
	TOTAL VARIANCE EXPLAINED	51.7	52.2			
	SUMMATED SCALE MEANS FOR ALL ATTITUDE FACTORS COMBINED	2.02		2.02		n.s.

Table 2

Multivariate Analysis of Variance for Attitudes Toward Computers

Source		df	Multivariate Tests of Pillai's V: F	(df)	Univariate F-Tests: Quality of Job Life	Work Effectiveness	Communication	Control
C (Type of Computer)								
	CANADA:	1	3.12**	(4,172)	4.60**	.55	4.40**	4.25**
	USA:	1	.11	(4,79)	.15	.00	.17	.01
C with effects of M removed	CANADA:	1	2.51**		3.41	.19	3.73**	3.61**
	USA:	1	.33		.29	.00	.01	.24
C with effects of S removed	CANADA:	1	2.95**		3.29	.36	6.87***	1.20
	USA:	1	.16		.30	.01	.21	.01
C with effects of M & S removed	CANADA:	1	2.62**		2.85	.20	6.15**	1.23
	USA:	1	.38		.39	.01	.02	.23
M (Hierarchical Level)								
	CANADA:	1	1.31	(4,172)	2.36	1.98	.72	.39
	USA:	1	3.90***	(4,79)	.25	.02	1.60	5.42**
M with effects of C & S removed	CANADA:	1	1.00		.94	1.56	1.13	.03
	USA:	1	1.00		.16	.06	1.63	5.62**
S (Sex)								
	CANADA:	1	3.37***	(4,172)	1.58	.27	.94	3.41***
	USA:	1	2.44*	(4,79)	7.60***	1.72	.79	.02
S with effects of C & M removed	CANADA:	1	3.51**		.05	.01	4.33**	3.14**
	USA:	1	2.30*		7.52***	1.77	1.02	.00

* $p < .06$
** $p < .05$
*** $p < .01$